

BAB X

PERENCANAAN PONDASI MINIPILE

10.1 Daya Dukung Tanah terhadap Pondasi

Data pondasi minipile :

Tiang minipile 30x30 cm

Luas pondasi $A_p := 30 \cdot 30 = 900 \text{ cm}^2$

Keliling dasar pondasi $K_p := 4 \cdot 30 = 120 \text{ cm}$

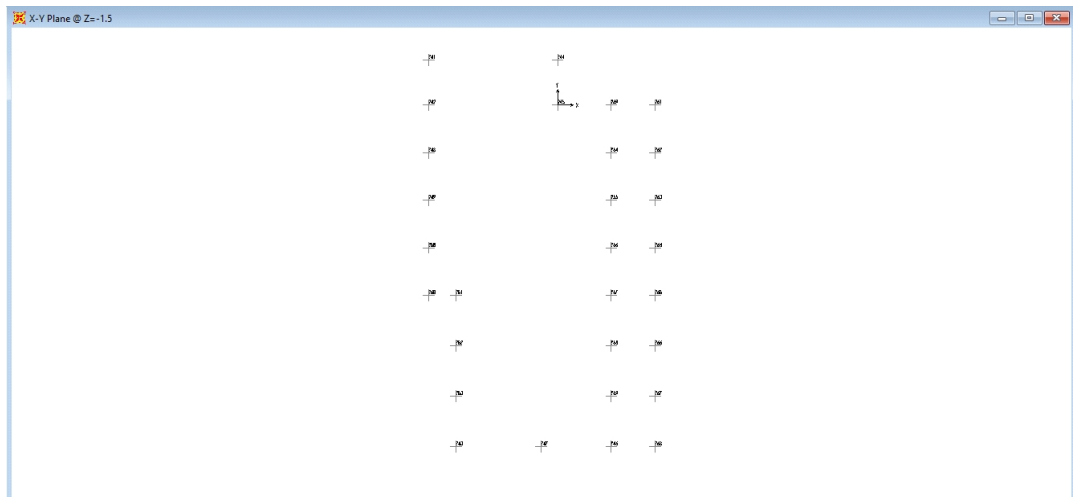
Data tanah :

Direncanakan panjang pondasi untuk kolom utama adalah 6 m

Pijin := 32.424 kg

10.2 Kebutuhan Pondasi

KEYPLAN PONDASI:

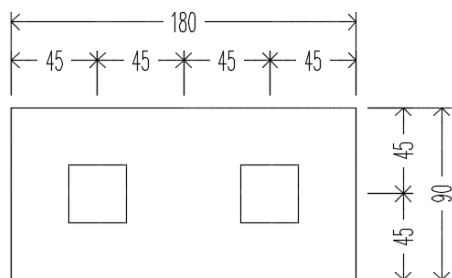


Output Beban

TABLE: Joint Reactions						
Joint	CaseType	F1	F2	F3	M1	M2
Text	Text	Tonf	Tonf	Tonf	Tonf-m	Tonf-m
241	Combination	1.374	-0.089	24.800	0.193	0.047
242	Combination	0.798	-0.025	40.275	0.182	0.160
243	Combination	0.384	0.066	20.758	0.065	0.040
244	Combination	-1.353	-0.331	24.645	0.460	-0.246
245	Combination	-0.816	-0.038	70.106	0.432	-0.395
246	Combination	-0.147	-0.151	25.249	-0.004	-0.107
247	Combination	-0.179	0.643	43.049	-1.015	-0.088
248	Combination	2.218	-0.026	48.824	0.185	0.534
249	Combination	2.037	-0.012	53.528	0.175	0.711
250	Combination	2.098	-0.022	46.645	0.167	0.503
251	Combination	1.321	-0.038	68.661	-0.038	0.255
252	Combination	1.403	0.158	47.847	-0.003	0.447
253	Combination	1.544	0.164	42.374	0.033	0.322
254	Combination	-1.549	-0.169	57.226	0.222	-0.403

255	Combination	-1.388	-0.109	70.558	0.142	-0.421
256	Combination	-1.560	-0.051	69.520	0.095	-0.485
257	Combination	-1.109	-0.031	66.946	0.077	-0.438
258	Combination	-0.956	0.008	65.477	0.057	-0.283
259	Combination	-1.049	0.243	57.073	-0.038	-0.250
260	Combination	0.701	0.037	3.577	0.159	0.167
261	Combination	-0.469	-0.032	10.811	0.020	-0.309
262	Combination	-0.292	0.005	12.353	0.012	-0.229
263	Combination	-0.477	-0.004	15.169	0.019	-0.281
264	Combination	-0.526	0.000	15.188	0.025	-0.320
265	Combination	-0.647	-0.005	16.382	0.036	-0.334
266	Combination	-0.462	0.010	16.880	0.041	-0.192
267	Combination	-0.356	0.031	15.579	0.039	-0.129
268	Combination	-0.249	-0.160	12.997	0.089	-0.115
269	Combination	-0.293	-0.072	10.598	0.275	-0.340

Asumsi dimensi pile cap P1:



$$b := 1.8 \quad \text{m}$$

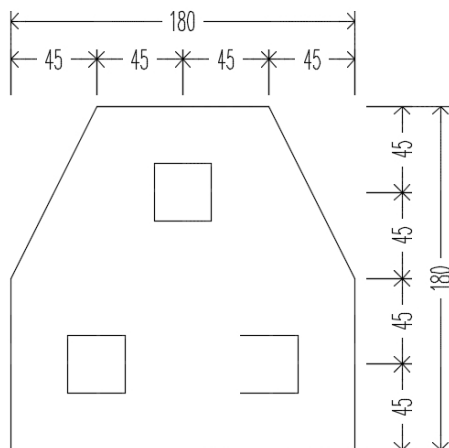
$$h := 0.9 \quad \text{m}$$

$$t := 0.5 \quad \text{m}$$

$$\gamma_{\text{beton}} := 2400 \quad \frac{\text{kg}}{\text{m}^3}$$

$$W_p := b \cdot h \cdot t \cdot \gamma_{\text{beton}} = 1944 \quad \text{kg}$$

Asumsi dimensi pile cap P2:



$$b := 1.8 \quad \text{m}$$

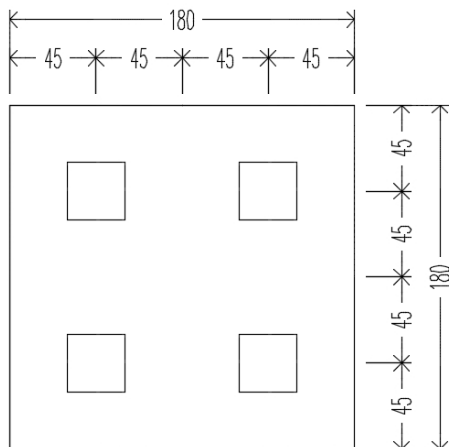
$$h := 1.8 \quad \text{m}$$

$$t := 0.5 \quad \text{m}$$

$$\gamma_{\text{beton}} := 2400 \quad \frac{\text{kg}}{\text{m}^3}$$

$$W_p := b \cdot h \cdot t \cdot \gamma_{\text{beton}} = 3888 \quad \text{kg}$$

Asumsi dimensi pile cap P3:



$$b := 1.9 \quad \text{m}$$

$$h := 1.9 \quad \text{m}$$

$$t := 0.5 \quad \text{m}$$

$$\gamma_{\text{beton}} := 2400 \quad \frac{\text{kg}}{\text{m}^3}$$

$$W_p := b \cdot h \cdot t \cdot \gamma_{\text{beton}} = 4332 \quad \text{kg}$$

10.3 Kebutuhan Strouss / Titik

TABLE: Joint Reactions						
Joint	CaseType	F3	WP	PU	QL	n
Text	Text	Tonf	Tonf	Tonf	Tonf	
241	Combination	24.800	3.888	28.688	32.424	3
242	Combination	40.275	3.888	44.163	32.424	3
243	Combination	20.758	3.888	24.646	32.424	3
244	Combination	24.645	3.888	28.533	32.424	3
245	Combination	70.106	3.888	73.994	32.424	3
246	Combination	25.249	3.888	29.137	32.424	3
247	Combination	43.049	3.888	46.937	32.424	3
248	Combination	48.824	3.888	52.712	32.424	4
249	Combination	53.528	3.888	57.416	32.424	4
250	Combination	46.645	3.888	50.533	32.424	4
251	Combination	68.661	3.888	72.549	32.424	4
252	Combination	47.847	3.888	51.735	32.424	4
253	Combination	42.374	3.888	46.262	32.424	4
254	Combination	57.226	3.888	61.114	32.424	4

255	Combination	70.558	3.888	74.446	32.424	4
256	Combination	69.520	3.888	73.408	32.424	4
257	Combination	66.946	3.888	70.834	32.424	4
258	Combination	65.477	3.888	69.365	32.424	4
259	Combination	57.073	3.888	60.961	32.424	4
260	Combination	3.577	1.944	5.521	32.424	2
261	Combination	10.811	1.944	12.755	32.424	2
262	Combination	12.353	1.944	14.297	32.424	2
263	Combination	15.169	1.944	17.113	32.424	2
264	Combination	15.188	1.944	17.132	32.424	2
265	Combination	16.382	1.944	18.326	32.424	2
266	Combination	16.880	1.944	18.824	32.424	2
267	Combination	15.579	1.944	17.523	32.424	2
268	Combination	12.997	1.944	14.941	32.424	2
269	Combination	10.598	1.944	12.542	32.424	2

10.4 Kontrol Efisiensi Tiang Kelompok

Asumsi efisiensi rata-rata tiang yang bekerja kelompok 0.85 Qijin sehingga :

$$P_{max} = (P_u / n) + ((M_x \cdot Y_{max}) / \sigma_y) + ((M_y \cdot X_{max}) / \sigma_x)$$

TABLE: Joint Reactions														
Joint	CaseType	PU	QL	n	M1	M2	XMAX	YMAX	SIGMAX2	SIGMAY2	PMAX	PEFF	RASIO	KET
Text	Text	Tonf	Tonf		Tonf-m	Tonf-m					Tonf	Tonf		
241	Combination	28.688	32.424	3	0.193	0.047	0.450	0.450	0.061	0.061	11.339	27.560	0.411	OK
242	Combination	44.163	32.424	3	0.182	0.160	0.450	0.450	0.061	0.061	17.255	27.560	0.626	OK
243	Combination	24.646	32.424	3	0.065	0.040	0.450	0.450	0.061	0.061	8.990	27.560	0.326	OK
244	Combination	28.533	32.424	3	0.460	-0.246	0.450	0.450	0.061	0.061	11.094	27.560	0.403	OK
245	Combination	73.994	32.424	3	0.432	-0.395	0.450	0.450	0.061	0.061	24.943	27.560	0.905	OK
246	Combination	29.137	32.424	3	-0.004	-0.107	0.450	0.450	0.061	0.061	8.891	27.560	0.323	OK
247	Combination	46.937	32.424	3	-1.015	-0.088	0.450	0.450	0.061	0.061	7.476	27.560	0.271	OK
248	Combination	52.712	32.424	4	0.185	0.534	0.450	0.450	0.081	0.081	17.174	27.560	0.623	OK
249	Combination	57.416	32.424	4	0.175	0.711	0.450	0.450	0.081	0.081	19.275	27.560	0.699	OK
250	Combination	50.533	32.424	4	0.167	0.503	0.450	0.450	0.081	0.081	16.355	27.560	0.593	OK
251	Combination	72.549	32.424	4	-0.038	0.255	0.450	0.450	0.081	0.081	19.342	27.560	0.702	OK
252	Combination	51.735	32.424	4	-0.003	0.447	0.450	0.450	0.081	0.081	15.402	27.560	0.559	OK
253	Combination	46.262	32.424	4	0.033	0.322	0.450	0.450	0.081	0.081	13.534	27.560	0.491	OK
254	Combination	61.114	32.424	4	0.222	-0.403	0.450	0.450	0.081	0.081	14.270	27.560	0.518	OK
255	Combination	74.446	32.424	4	0.142	-0.421	0.450	0.450	0.081	0.081	17.061	27.560	0.619	OK
256	Combination	73.408	32.424	4	0.095	-0.485	0.450	0.450	0.081	0.081	16.186	27.560	0.587	OK
257	Combination	70.834	32.424	4	0.077	-0.438	0.450	0.450	0.081	0.081	15.706	27.560	0.570	OK
258	Combination	69.365	32.424	4	0.057	-0.283	0.450	0.450	0.081	0.081	16.089	27.560	0.584	OK
259	Combination	60.961	32.424	4	-0.038	-0.250	0.450	0.450	0.081	0.081	13.643	27.560	0.495	OK
260	Combination	5.521	32.424	2	0.159	0.167	0.450	0.000	0.041	0.000	4.523	27.560	0.164	OK
261	Combination	12.755	32.424	2	0.020	-0.309	0.450	0.000	0.041	0.000	6.594	27.560	0.239	OK
262	Combination	14.297	32.424	2	0.012	-0.229	0.450	0.000	0.041	0.000	7.286	27.560	0.264	OK
263	Combination	17.113	32.424	2	0.019	-0.281	0.450	0.000	0.041	0.000	8.765	27.560	0.318	OK
264	Combination	17.132	32.424	2	0.025	-0.320	0.450	0.000	0.041	0.000	8.839	27.560	0.321	OK
265	Combination	18.326	32.424	2	0.036	-0.334	0.450	0.000	0.041	0.000	9.562	27.560	0.347	OK
266	Combination	18.824	32.424	2	0.041	-0.192	0.450	0.000	0.041	0.000	9.872	27.560	0.358	OK
267	Combination	17.523	32.424	2	0.039	-0.129	0.450	0.000	0.041	0.000	9.199	27.560	0.334	OK
268	Combination	14.941	32.424	2	0.089	-0.115	0.450	0.000	0.041	0.000	8.460	27.560	0.307	OK
269	Combination	12.542	32.424	2	0.275	-0.340	0.450	0.000	0.041	0.000	9.325	27.560	0.338	OK